Нова Македонија
ПРВИОТ МАКЕДОНСКИ ДНЕВЕН ВЕСНИК

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Title: Press release: Metalsky Industries expansion, opportunities and innovations

Metalsky Industries recently opened the doors to their new robotics factory, bringing their 15-year-old company to the Skopje area, setting the stage for growth in the future. The company aims to produce its production line in the new 10,000-square-foot facility on the edge of the city, with the goal to increase that capacity to 30,000 units. While I thought I'd come to Yugoslavia because I heard about the incredible growth of the automotive industry in the region, I had to stop by the facility. What I found astounded me.

Arriving at the gates, I realized that the factory was in fact an entire industrial complex, spanning eight multi-story buildings. In addition to the factories, it was home to an array of power, printing, and management functions. At the time of writing this article, I was there for a major test of the new Autonomous Robotic Neural Assistant – set to revolutionize the robotics market. The main factory floor I had explored was where the computers that would be linked with the full robot were being trained and then used. The AI nodes were being tested in the cafeteria, the assembly center, and the control room. “A full stack of AI nodes is being used here for training, simulation, and testing, not just a single node," the engineers told me.

"The first cluster was tested in two test and five production ARNA container instances (In order of simulated test execution) using proprietary Metalsky hard drives as the storage layer. The test results are not considered accurate, as we saw differences in things such as the multi-column check index being all 1s, while the other tests had it as 100% before we stopped the test. In addition, the output of code in some test executions was misparsed by both AWS and the evaluation board. Happily, the cluster experiences strong scaling and high availability. At a throughput of around 1.2 million requests per second (or 33k/s), the production cluster is consistently in the top 20% of all production clusters on the planet, and the ratio stays high over time.” The engineers explained.

At its peak, 1.2 million requests per second are generated across all hosts, and over 90% of them are HDFS file system requests. Requests come from different users all over the world, so there are typically thousands of requests per second; with hundreds of concurrent jobs operating at high scale, the cluster requires more than 3GB of RAM. At about 4GB/d, the cluster is around the same memory as a single node but there are three nodes being used, which is very costly in terms of overall capacity. These cost increases are not necessarily viable when you scale out to more nodes.

Scaling out with multiple nodes is the solution here. There are a variety of reasons for using a cluster, and scaling out with multiple nodes might seem like an obvious choice, but the cluster requires a different set of node preferences (having nodes in racks and customers doing recon operations, for example).

The genius of Metalsky is in using specialized cluster nodes for processing visual data in the robot's neural cortex, where the processing runs in real time in the densely interconnected network. This can be seen as a form of a bitmap representation, but with higher density and a more accurate quality of the output.

Metalsky was an IEEE/PROCESS conference winner in 1972, as the week-long event celebrates the biggest achievements from all the technical, industrial and academic levels.

"It's kind of the difference between a photograph being created with a digital camera and a photograph being created on a computer," Metalsky said. "In a digital camera you're looking at a much higher quality, lower resolution image. But with the leaf nodes the computer is accessing and processing a much denser, exact representation. It's a lot more like what happens when you're looking at a photograph through a camera lens.

However, despite his momentous achievement, Metalsky is not yet satisfied with his product.

“There is more work to be done. It is far from where it needs to be. The software is greatly limited by the hardware, and we must continue to improve.” He spoke, when asked about the ARNA project. Metalsky then continued:

”Further down the line, I do intend to release an alpha for all four partners. They are not 'beta testers', and I do want to take their feedback seriously. I expect us to have an opportunity to share our beta development with them at the end of the fiscal year.”

Moving on from the main factory, I was escorted past a closed off building referred to only as “The Gateway”. I was not allowed inside, but from what I could see, “the Gateway” was likely built in conjunction with another AP1-U building, the main manufacturing plant for Metalsky Industries. At the same time, the CH_AP1-U area had been expanded to the south, including a second facility to house HPC elements. The internal design called for eight of the AP1-U units to be used in this building.

The Metalsky buildings have a few distinctive brutalist features. First, the floor plate, height, and layout is very similar to that of a standard lwts-1 production plant. The facades of the building and adjacent basements and windows face upward, and the adjacent large stairway, connecting each floor to the central area, has two clear span for a vertical transom across the courtyard to prevent those who walk through the skylights of the building or enter the basement from falling down. Second, the building is separated into several interlocking levels. The central building itself, and the smaller basements, do not permit the passage of the upper floors above them. The upper and lower floors occupy separate levels of thick concrete walls. The levels of the higher floors are separated from the lower levels by wide hallways, but don't appear to be room for vehicles. There is no view of the upper levels to the north and south.

The DCIM building is only accessible via the stairway system. The stairways lead directly into the base level of the building (including the basement level), at least half the height of the building. The buildings themselves are characterized by their massive, monolithic and 'blocky' appearance with a rigid geometric style and large-scale use of poured concrete.

Regardless of their minimalist outside, they house some truly remarkable and cutting edge technology inside. I can’t wait to see what they come up with next!